REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 3-4, 8-9, 11-12 and 16-17 are pending, with Claim 18 canceled and Claims 3-4, 8-9, 11-12 and 16-17 amended by the present amendment.

In the Official Action, Claim 18 was rejected under 35 U.S.C. §112, first paragraph; the specification was objected to; Claim 18 was rejected under 35 U.S.C. §101; and Claims 3-4, 8-9, 11-12 and 16-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Silva et al. ("Modeling and Verifying Hybrid Dynamic System Using Checkmate," hereinafter "Silva") in view of Aarnio et al. ("Using Simulation During Development of Combined Manipulator and Hybrid Locomotion Platform," hereinafter "Aarnio").

Claim 18 is cancelled without prejudice or disclaimer. In view of the cancellation of Claim 18, the rejections under 35 U.S.C. §112 and §101, as well as the objection to the specification, is moot.

Claims 9 and 17 are amended to more clearly describe and distinctly claim Applicants' invention. Support for this amendment is found in Applicants' originally filed specification.[1] Claims 3-4, 8, 11-12 and 16 are amended cosmetically. No new matter is added.

Briefly recapitulating, Claim 17 is directed to

> A method of simulating a mechanism, comprising:
> reading data representing a plurality of variables of a continuous system equation of a hybrid model described in a hybrid model programming language having a class definition functionality based on an object-oriented approach;
> reading data representing a plurality of mechanism elements of a three-dimensional mechanism model;
> extracting, from the data representing the variables, a plurality of selective variables each of which enables to be associated with any one of the mechanism elements;

[1] Specification, page 21, lines 15-25.

extracting, from the data representing the mechanism elements, a plurality of selective mechanism elements each of which enables to be associated with any one of the variables;

receiving a selection which is made by a user and is indicative of a combination of one of the plurality of selective variables and one of the plurality of selective mechanism elements, to generate a table that represents a correspondence between the variables and the mechanism elements based on the selection, wherein the one of the plurality of selective variables in the combination is selected by selecting a class of predefined hybrid model to which the selective variables belong, and selecting a member variable in the class;

calculating a value of one of the variables of the continuous system equation by a first simulator that executes the hybrid simulation in which a behavior of the mechanism is simulated;

identifying a mechanism element corresponding to a variable having the calculated value, referring to the table;

transmitting, to a second simulator, information specifying the identified mechanism element and the calculated value of the variable; and

executing a kinematic simulation by the second simulator based on the information in which a geometrical operation of the mechanism is simulated.

Silva describes the CHECKMATE simulation tool. CHECKMATE uses two models of high persistence, including a threshold-event-driven hybrid system (TEDSHS) which includes three types of subsystems: a switched continuous (SCS), a threshold event generator (TEG), and a finite state machine (FSM). As illustrated in Figure 7 of Silva, CHECKMATE converts the TEDSH into a polyhedral invariant hybrid automaton (PIHA). The PIHA of CHECKMATE are a subclass of more generalized hybrid automata. A hybrid automaton is a generalization of the finite automaton that includes continuous dynamics within each discrete state. Each discrete state is called a location. Associated with each location is an invariant, the condition which the continuous state must satisfy while the hybrid automaton resides in that location, and the flow equation representing the continuous dynamics in that location. Transitions between locations are called edges. Each edge is enabled when a guard condition is satisfied. Upon the location transition, the values of the continuous state before and after the transition must satisfy a reset condition.

The Official Action points to the recitation of the word "class" in the description of checkmate by Silva as being equivalent to Applicants' claimed class. Applicants traverse as the class of the present invention is an object oriented class, and not a class of hybrid automata as discussed in Silva. Claims 9 and 17 are amended to further clarify the differences between the present invention and Silva. That is, Silva does not disclose or suggest Applicants' claimed hybrid model programming language having a class definition functionality based on an object-oriented approach. Silva also does not disclose or suggest calculating a value of one of the variables of the continuous system equation by a first simulator that executes the hybrid simulation in which a behavior of the mechanism is simulated. Silva also does not disclose or suggest executing a kinematic simulation by the second simulator based on the information in which a geometrical operation of the mechanism is simulated.

Applicants have considered Aarnio and submit Aarnio does not cure the deficiencies of Silva. Aarnio describes a 3D graphical simulation model of a robot. Like Silva, Aarnio does not disclose or suggest Applicants' claimed hybrid model programming language having a class definition functionality based on an object-oriented approach.

As none of the cited prior art, individually or in combination, disclose or suggest all the elements of independent Claims 9 and 17, Applicants submit the inventions defined by Claims 9 and 17, and all claims depending therefrom, are not rendered obvious by the asserted references for at least the reasons stated above.[2]

[2] MPEP § 2142 "...the prior art reference (or references when combined) must teach or suggest **all** the claim limitations.

Accordingly, in view of the present amendment and in light of the previous discussion, Applicants respectfully submit that the present application is in condition for allowance and respectfully request an early and favorable action to that effect.

Respectfully submitted,

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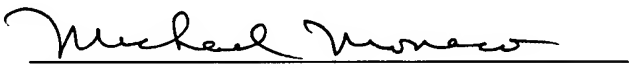

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